

CCS Deployment Drivers and Incentives

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AEP CCS Validation Facility

1,300 MWe Mountaineer Plant, New Haven, WV



- Scale: 20 MWe slipstream
 - ~1.5% of power plant flue gas
- Cost: >\$100M
 - Funding by AEP, Alstom, RWE, & EPRI
- Capture: Alstom Chilled Ammonia Process
 - Ammonium Carbonate/Bicarbonate Reaction
 - >85% CO₂ capture rate
- Sequestration: Deep saline formation storage
 - ~100,000 tons CO₂ per year
 - ~1.5 miles below the plant surface
- First CO₂ Capture: September 1, 2009
- First CO₂ Storage: October 1, 2009
- Planned operation: 1 to 5 years



AEP CCS Commercialization Project

1,300 MWe Mountaineer Plant, New Haven, WV

FINANCIAL ASSISTANCE FUNDING OPPORTUNITY ANNOUNCEMENT



U.S. Department of Energy

National Energy Technology Laboratory

Recovery Act: Clean Coal Power Initiative - Round 3

DE-FOA-0000042* Funding Opportunity Number:

*NOTE: This Funding Opportunity Announcement (FOA) is an amendment of FOA No. DE-PS26-98NT43181. Both numbers, DE-PS26-98NT43181 and DE-FOA-0000042, are associated with the Clean Coal Power Initiative - Round 3.

Amendment 005** to the Final FOA (DE-PS26-Announcement Type: 08NT43181)

**Ail amendments that were issued on DE-DS26-08NT43)81 prior to this amendment have been accepted and incorporated into this resulting document. Only changes associated with this current amendment, 005, are included in purple colored font.

CFDA Number:

Original Issue Date: Amendment 005 Issue Date: Letter of Intent Due Date:

Application Due Date:

August 11, 2008 June 9, 2009

July 24, 2009, 5:00:00 PM Eastern Time August 24, 2009, 8:00:00 PM Eastern Time

See next page for the purpose of this amendment.

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- Scale: Full commercial demonstration
 - 235 MWe Slipstream
- Cost: ~\$668M
- Funding: CCPI Round III Selection
 - DOE awarded 50% cost share, up to \$334M
 - Cooperative agreement signed in January, 2010
- Capture: Alstom Chilled Ammonia Process
 - ~90% CO₂ capture rate
- Sequestration: Deep saline formation storage
 - ~1,500,000 tons CO₂ per year
 - ~1.5 miles below the surface
 - Pipeline system with off-site wellheads
- **Geologic Experts Advisory Group**
 - Battelle, Schlumberger, CONSOL, MIT, Univ. of Texas, Ohio State, WVU, LLNL, WV Geo. Survey, OH Geo. Survey. & WV DOE
- Planned Operation: Startup in second half of 2015



CCS Incentives

- Public private partnerships needed
 - Grants
 - Loan Guarantees
 - Bonus Allowances
 - Tax incentives
- Regulatory implications for rate recovery
 - Caps
 - Technology risks
 - Lack of climate legislation
- Storage barriers
 - Pore space ownership
 - Long term liability
 - Lack of large saline storage projects



Thank You